Drilling and Boring Machine Tool Setters, Operators, and Tenders

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What They Do

Drilling and Boring Machine Tool Setters, Operators, and Tenders set up, run, and tend drilling machines that drill, bore, ream, mill, or countersink metal or plastic workpieces. Job duties usually vary with the type of machine being operated and the overall size of the business. Although some workers specialize in one or two types of machinery, many are trained to set up or operate a variety of machines. These workers are found in the automotive, aerospace, marine, and construction industries. For example, a worker in the aerospace industry may drill slots or holes in airplane turbine blades.

Tasks

- Study machining instructions to determine dimensional and finish specifications, sequence of operation, setup, and tooling requirements.
- Lift workpiece either manually or with hoist onto machine table, or directs crane operator to lift and position workpiece.
- Position and secure workpiece on table with bolts, jigs, clamps, shims, or other holding devices, using machining hand tools.
- Lay out reference lines and machining locations on work, applying knowledge of shop math and layout techniques, using layout tools.
- Select cutting tool according to instructions and knowledge of metal or plastic properties.
- Install tool in spindle.
- Operate single or multiple-spindle drill press to bore holes to perform machining operations on metal, nonmetallic, or plastic workpieces.
- Operate tracing attachment to duplicate contours from templates or models.
- Verify conformance of machined work to specifications, using measuring instruments, such as calipers, micrometers, and fixed and telescoping gauges.

*Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

Important Skills, Knowledge, and Abilities

- Installation — Installing equipment, machines, wiring, or programs to meet specifications.
- Mathematics — Using mathematics to solve problems.
- Equipment Selection — Determining the kind of tools and equipment needed to do a job.

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- Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.
- Operation and Control — Controlling operations of equipment or systems.
- Reading Comprehension — Understanding written sentences and paragraphs in work-related documents.
- Quality Control Analysis — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
- Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Written Comprehension — The ability to read and understand information and ideas presented in writing.
- Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.
- Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.

Work Environment

Most Drilling and Boring Machine Tool Setters, Operators, and Tenders (Metal and Plastic) work in clean areas with good lighting and ventilation. Operating high-speed machines can be dangerous if strict safety precautions are not taken. Most Operators wear protective equipment like safety glasses and earplugs, to protect the worker from flying particles and machine noise. Many modern machines are enclosed, which minimizes the exposure to noise, dust, and lubricants.

Most workers in this occupation work 40 hours per week with overtime common during periods of peak production. Many metal and plastics working shops operate around the clock, so night and weekend shifts are also common. Many Drilling and Boring Machine Tool Setters, Operators, and Tenders (Metal and Plastic) belong to a union, such as the International Association of Machinists and Aerospace Workers.

California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Drilling and Boring Machine Tool Setters, Operators, and Tenders (Metal and Plastic)				
51-4032	3,200	3,100	100	$9.95 to $16.47

Wages do not reflect self-employment.
Average annual openings *include new jobs plus net replacements.*
Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

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Trends

All job opportunities for Drilling and Boring Machine Tool Setters, Operators, and Tenders during the 2004–2014 period will come from the need to replace existing workers who retire or leave for other kinds of work. The slight decline expected for this occupation is partly due to strong foreign competition, which has pushed some production operations offshore to countries where costs are lower. Other reasons include the increased use of computer-controlled equipment and robots, which speed productivity and require more skilled machinists.

Training/Requirements/Apprenticeships

Drilling and Boring Machine Tool Setters, Operators, and Tenders usually follow one of the following training paths:

- Vocational school
- Community College programs or certificates
- Extensive on-the-job training

A few weeks of on-the-job training is sufficient for most workers to learn basic machine operations, but several years are required to become a highly skilled operator or setter. Community colleges and other educational institutions offer courses and certifications in operating metal and plastics machines. Programs accredited by the National Institute for Metalworking Skills (NIMS) and the Society of the Plastics Industry are listed at their respective Web sites. Some employers send promising machine tenders to operator classes and others prefer to hire workers who have completed, or are currently enrolled in, a training program. Many employers require a high school diploma and the ability to read, write, and speak English.

Recommended High School Course Work

High school students interested in this kind of work should take courses in metal shop and blueprint reading, gain a working knowledge of the properties of metals and plastics, and have a solid math background with course work in algebra and geometry.

Where Do I Find the Job?

Direct application to employers remains one of the most effective job search methods.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search under the following industry names to get a list of private firms and their addresses:

- Aircraft
- All Other Motor Vehicle Parts
- Aluminum Foundries (except Die-Casting)
- Bare Printed Circuit Board
- Gasoline Engines and Engine Parts
- Iron and Steel Mills
- Machine Shops
- Other Aircraft Parts and Equipment
- Other Engine Equipment
- Precision Turned Product
- Semiconductor and Related Devices
- Turbine Generator & Generator Set Units

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Search these **yellow page** headings for listings of private firms:

- Aircraft Parts and Supplies
- Automobile Parts, Whsle & Manufacturers
- Foundries
- Generators
- Machine Shops
- Printed and Etched Circuits
- Screw Machine Products
- Semiconductor Devices

Where Can the Job Lead?

Advancement for workers in this occupation usually takes the form of higher pay. Some workers may advance to supervisory positions. Opportunities for advancement can be increased by becoming certified in a particular machining skill.

Other Sources of Information

International Association of Machinists and Aerospace Workers
www.iamaw.org

National Institute for Metalworking Skills
www.nims-skills.org

Precision Metalforming Association Educational Foundation
www.pmaef.org

Precision Machined Products Association (PMPA)
www.pmpa.org

The Society of the Plastics Industry
www.socplas.org

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